



Pre-installation Manual

AX-201

PHILIPS

Assembleon
Integrated electronics manufacturing solutions

Document	Pre-installation Manual AX-201
Based on	-
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Pre-installation Manual

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CHAPTER 1 Checklist

Subject		Summarized requirements AX-201!	Checked	Reference information
Packed transport and storage				2.1
Temporary storage available?			Yes / No / N.a.	
Environmental conditions				2.1.2
• Temperature		-25°C to +55°C	OK / NOK	
• Relative humidity		5 to 90%	OK / NOK	
Transport equipment available?			Yes / No / N.a.	2.1.3
Transport route accessible?			Yes / No / N.a.	-
Unpacking tools available?			Yes / No / N.a.	2.1.4
Crated dimensions and weights				2.1.5
• LxWxH dimensions		2650 x 2150 x 1900 mm	OK / NOK	
• Gross weight		2350 kg.	OK / NOK	
Unpacked transport and operation				2.2
Operating conditions				2.2.1
• Temperature		20°C to 28°C to produce within spec.	OK / NOK	
• Relative humidity		20% to 90%, no condensation	OK / NOK	
• Dust class		≤ 100,000	OK / NOK	
Transport equipment available?			Yes / No / N.a.	2.1.3
Transport route accessible?			Yes / No / N.a.	
Unpacking tools available?			Yes / No / N.a.	2.1.4
Dimensions and weight				2.2.3
• LxWxH dimensions		1852 x 1890 x 1545 mm	OK / NOK	
• Weight excluding trolleys, feeders		1950 kg.	OK / NOK	
Floor conditions				2.2.5
• Weight including trolleys, feeders		2450 kg.	OK / NOK	
• Average floor loading		± 6000 N/m ²	OK / NOK	
• Floor loading per foot		± 55 x 10 ⁴ N/m ²	OK / NOK	
• Floor flatness		< 1%	OK / NOK	
Installation tools PA 2435/00 available?			Yes / No / N.a.	2.2.6
Machine can be positioned according floor plan?			Yes / No / N.a.	2.2.7
Flow line SMEMA compatible?			Yes / No / N.a.	2.3.4
Compressed air supply:				2.3.3
• Pressure, flow		6-8 Bar at 190 NI/min.	OK / NOK	
• Oil content		< 0.1 mg/m ³	OK / NOK	
• Dew point,		< 2°C at 7 Bar, < 4°C at 7.2 Bar	OK / NOK	
• Dust particle size		< 10 µm	OK / NOK	
• Ducting			OK / NOK	
Machine without transformer				
Mains voltage supply:				2.3.2
• Nominal mains voltage		208 230 400 480 Volts	OK / NOK	
• Corresponding full load current		19 18 10 8 Amp.	OK / NOK	
• Electric power requirement		7 kVA (nominal)	OK / NOK	
• Voltage configuration		3-phases and ground	OK / NOK	
• Frequency		47 - 63 Hz	OK / NOK	
• Ducting			OK / NOK	
• Grounding resistance		< 0.1 Ohm	OK / NOK	

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Machine with (optional) transformer			
Mains voltage supply:			2.3.2
• Nominal mains voltage	400 Volts	OK / NOK	
• Corresponding full load current	10 Amp.	OK / NOK	
• Electric power requirement	7 kVA (nominal)	OK / NOK	
• Voltage configuration	3-phases, Neutral and ground	OK / NOK	
• Frequency	47 - 63 Hz	OK / NOK	
• Ducting		OK / NOK	
• Grounding resistance	< 0.1 Ohm	OK / NOK	
Testing			
Placement program available?		Yes / No / N.a.	
Components available?		Yes / No / N.a.	
Acceptance test procedure agreed?		Yes / No / N.a.	
Optional			2.4
Off-line preparation area		Yes / No / N.a.	2.4.1
Maintenance area		Yes / No / N.a.	2.4.2
Storage area		Yes / No / N.a.	2.4.3
External emergency circuit		Yes / No / N.a.	2.4.4
Local area network		Yes / No / N.a.	2.4.5
Telephone line close by machine		Yes / No / N.a.	
Recommended tooling		Yes / No / N.a.	2.5



NOTE: Any deviation from these installation and safety requirements may cause deterioration in system specification.

Signature	
Customer Support acceptance	
User acceptance	
Date	

Figure 1

CHAPTER 2 Reference information

2.1 Packed transport and storage

2.1.1 Storage

The machine needs to be (temporarily) stored indoors when the delivery is not directly followed by installation

2.1.2 Environmental conditions

Description	Specification
Temperature	-25 to +55 °C (< +70 °C for a period of 24 hrs.)
Relative humidity	5 to 90% (no condensation, before unpacking leave the system in the crate for at least of 1 day for acclimatization purposes This specially after air transport).
Vibration	10 - 55 Hz 0.6 mm peak to peak.
Bump	< 10 g for 6 ms.
Storage	Sheltered area.

Figure 2 Environmental conditions

2.1.3 Transport equipment

The customer, in consultation with the Assembléon representative, must arrange equipment for unloading and transporting the machine. Depending on the local circumstances, one or more of the following equipment is required.

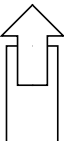
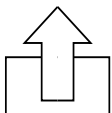

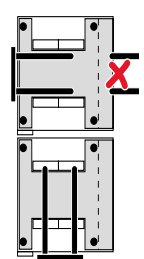
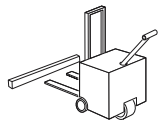
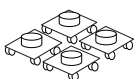
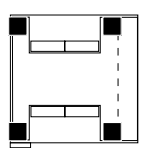
Transportation	Equipment	Fork position	Equipment specification
Crosswise or Lengthwise (In case of narrow passages)  	Forklift truck 		Lifting capacity >2500 kg, fork length > 1.5 m. Do not pick at control supply unit side.
	A pallet car 		
	Installation wheel set 		Special prepared set with foot guide area, for transportation by using hand power. A smooth floor without irregularities is necessary when using the installation wheel set.

Figure 3

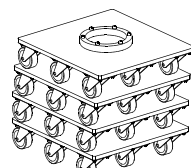
Description	Ordering code	Application	Identification and picture
Installation wheel set	9498 396 00145	Set of 4 lorries for manual machine transportation.	4022 510 1763 

Figure 4

2.1.4 Unpacking tools

Unpacking is restricted to **Assembléon representatives**.

For unpacking, the following tools must be available at the site:

- (Powered) screwdriver.
- Cross head bits for screwdriver.
- Open-ended spanner M24 (width 36 mm), part of the installation tooling.

2.1.5 Crate dimensions and gross weights

The machine is delivered in a completely sealed crate (air freight proof), and fixed to the crate bottom.

For some markets this machine can be delivered on just the crate bottom, resulting in a deviated packing height and gross weight.

Unpack as close to the final site as possible, to avoid machine damage

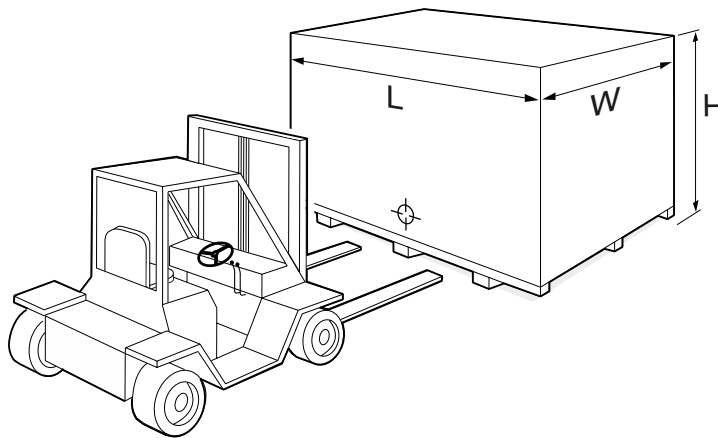


Figure 5

	Length	Width	Height	Gross weight
Crate with AX-201	2650 mm	2150 mm	1900 mm	2350 kg

Figure 6 Crate dimensions and weight



NOTE: Depending on the order, the shipment can include additional crate(s), which contain a number of smaller items, such as tape feeders, etc. The dimensions of these crates depend on the number and size of the ordered items, but will always be smaller than the ordered and above-mentioned crate.

2.2 Unpacked transport and operation

2.2.1 Operating conditions

Ambient temperature range	
• operation within specification	from +20 to +28 °C
• all functions operational	from +15 to +35 °C
Relative humidity	20% to 90%, no condensation
Dust class	≤ 100,000 (average industrial environment)

Figure 7

2.2.2 Static electricity

No special measures are required for operating use.

However, special attention must be paid to electrostatic discharge prevention during maintenance activities. These measures must be known and applied by all maintenance engineers.

2.2.3 Machine weight, excluding trolleys

Machine	Weight
AX-201	1950 kg

Figure 8 Machine weight, excluding trolleys

2.2.4 Machine dimensions and weight, including trolleys

Sizes with trolleys, lamp post and touch screen(s)
(Sizes in millimetres)

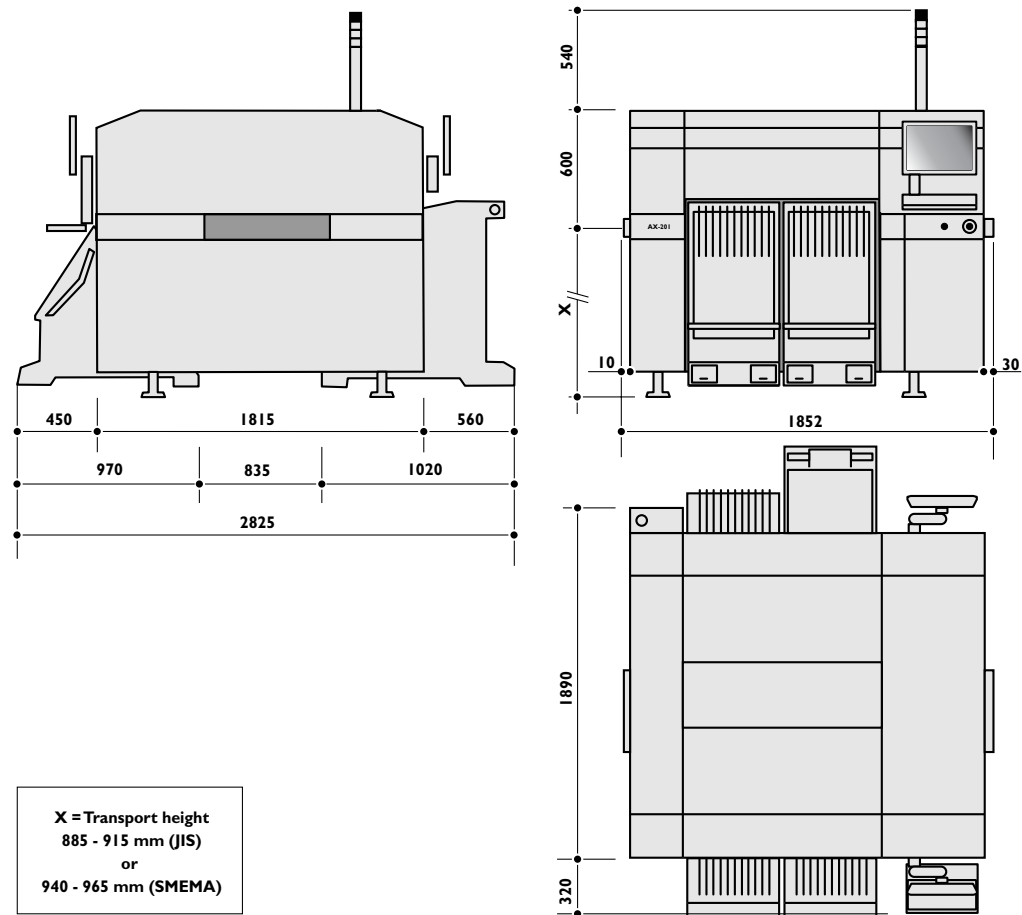


Figure 9 Machine dimensions, including trolleys

	AX-201
Weight incl. trolleys and feeders	Max. 2450 kg.

Figure 10 Machine weight, including trolleys

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2.2.5 Floor conditions

- Required floor quality for the feeder trolley handling area

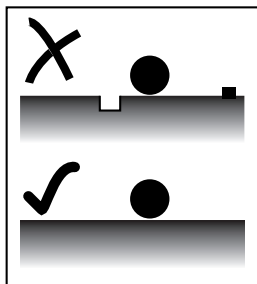
- **Floor surfacing**

The floor covering must be easy to clean and impervious to oil.

- **Floor flatness**

A flat floor without grooves is essential for a smooth feeder trolley handling.

Floor flatness < 1% in all directions, bumps ≤ 5 mm.

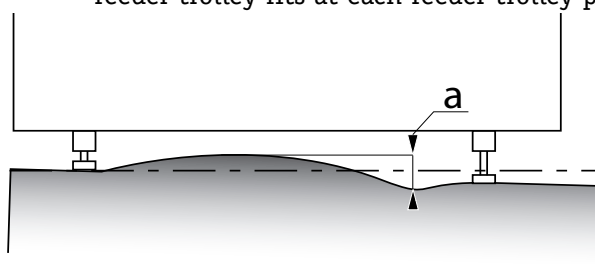


- Floor level deviations

After levelling the machine, the floor level, related to the machine, can vary between the feeder trolley positions.

The floor level of every feeder trolley position has to be within specification.

Maximum allowed deviation (a) is ± 13 mm. (X,Y direction) This to be sure a feeder trolley fits at each feeder trolley position on all lines.



NOTE: If feeder trolleys are used on several lines, then the floor conditions between those lines have to be within the same specification.

2.2.6 Installation tools

The set-up tooling kit contains tools needed for installation and maintenance of the machine. For the content of this kit, see [2.5.1 Setup tooling kit \(PA 2435/00\)](#).

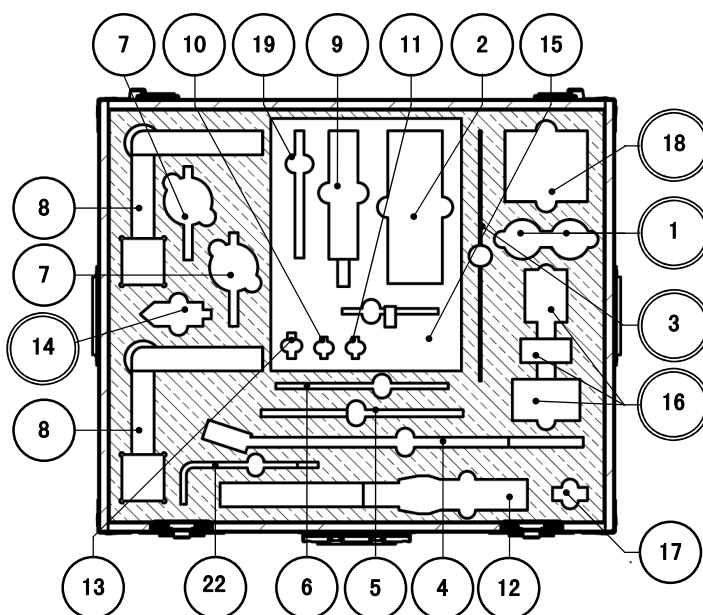


Figure 11 Set-up tooling kit (PA 2435/00)

2.2.7 Floor plan

This paragraph provides the principal characteristics of the machine . The minimum access clearance mentioned in the following paragraphs relates to the space needed both for servicing and/or operation.

- Overall dimensions of the machine, see [figure 9](#).

Extra floor requirements	
For operation and service	1560 x 4800 mm, see figure 13
Weight, incl. trolleys	2450 kg
Supporting feet (see Figure 14)	Four adjustable feet (range 85 mm)
Floor loading per foot	$55 \times 10^4 \text{ N/m}^2$
Floor requirements	Supporting feet must rest directly on a concrete floor or on steel plates 250 x 250 x 10 mm
Floor flatness	The max. floor angle is 1% in all directions.
Fire safety	Do not place the machine on a floor that is made of flammable material.
Average floor load	max. 6000 N/m ² .

Figure 12 Extra floor requirements

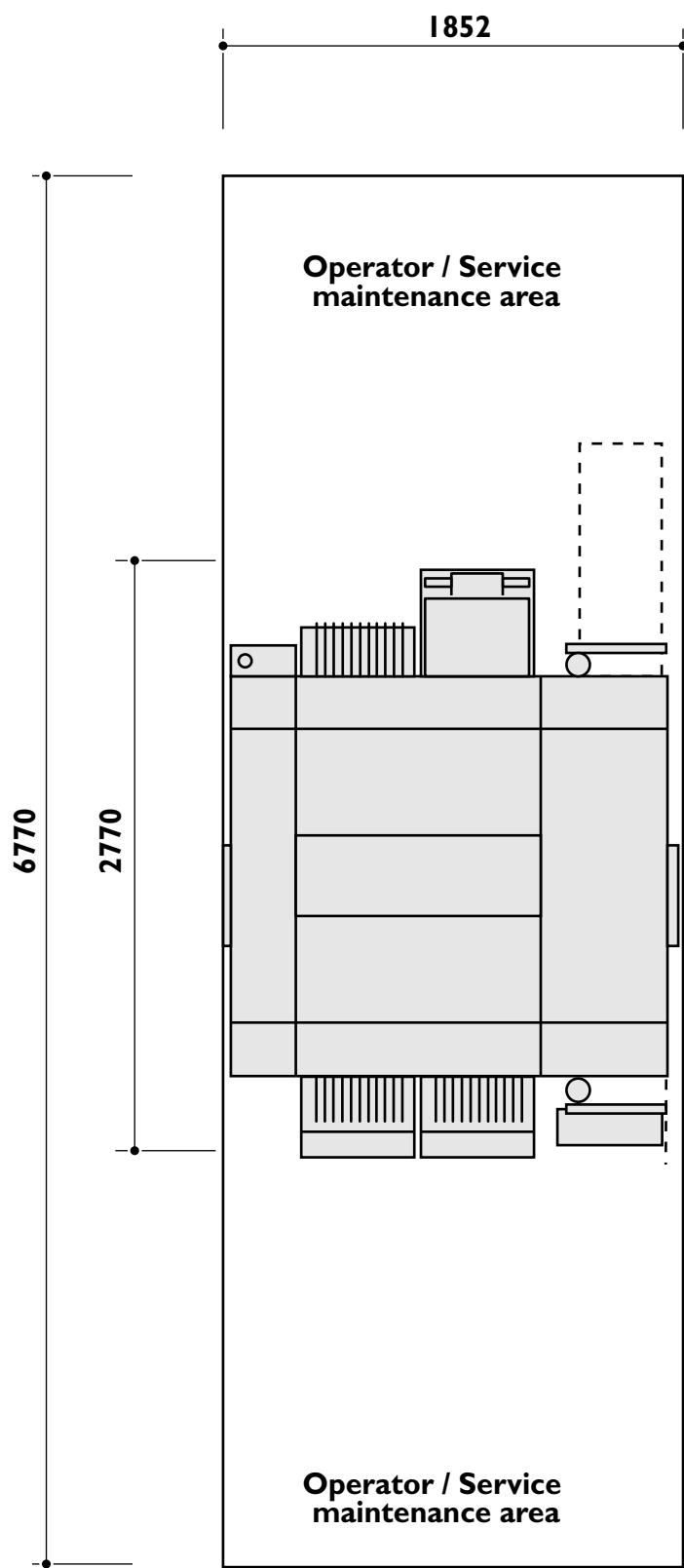


Figure 13 Floor space requirements

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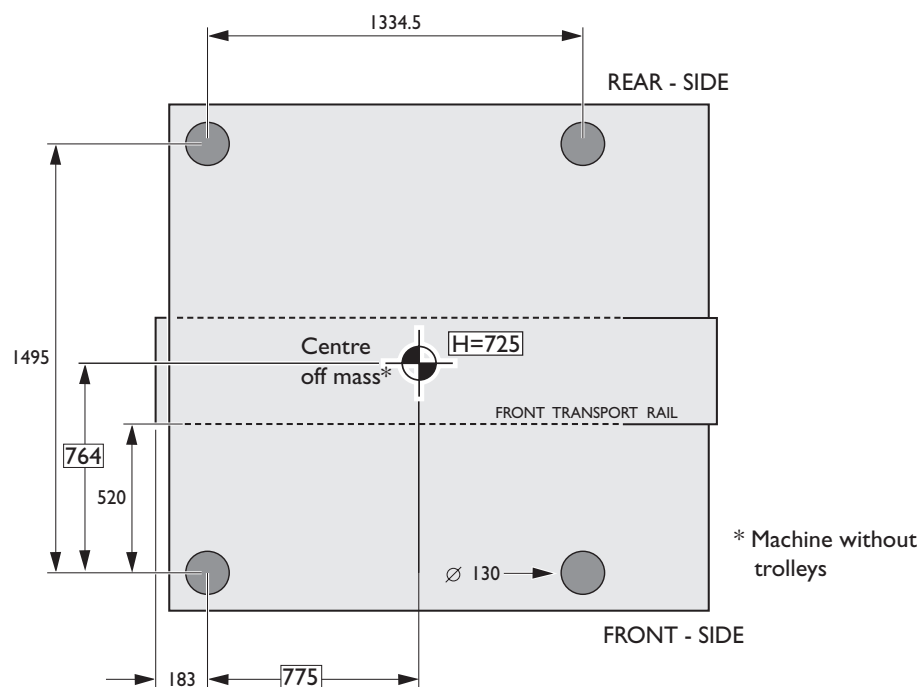


Figure 14 Supporting feet and gravity point

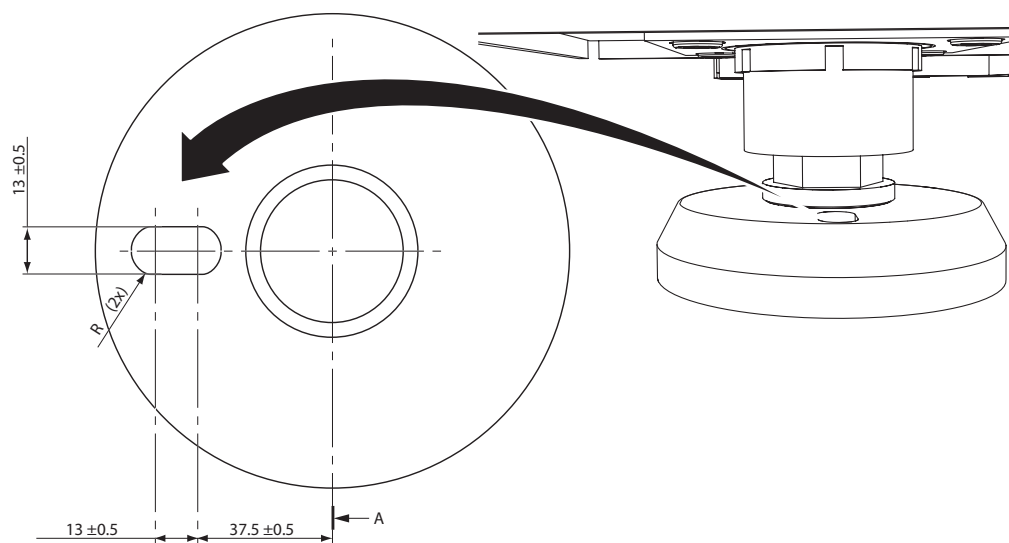


Figure 15 Foot with floor anchoring device

2.3 Connections to services

2.3.1 Location of connection points

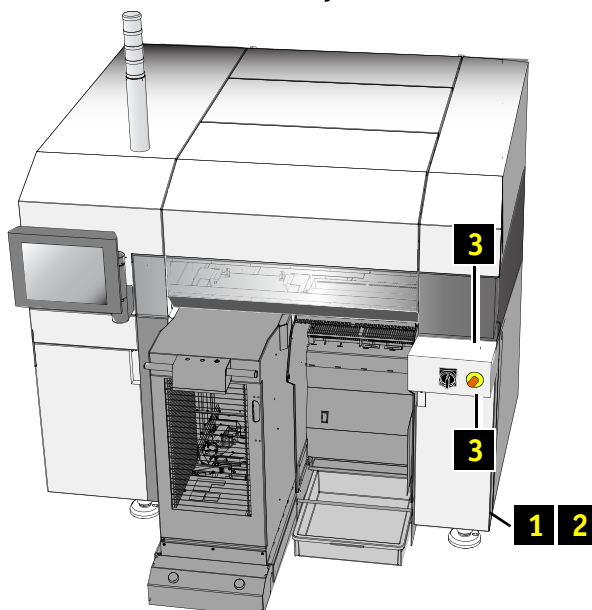


Figure 16 Factory compressed air and power supply connections

1. Factory compressed air connection, see [2.3.3](#)
2. Factory vacuum connection, see [2.3.3](#)
3. Power supply connection, see [2.3.2](#).

2.3.2 Power supply

The mains cable must be routed through a separate metal duct or pipe. This duct or pipe must be grounded, to avoid EMI (electromagnetic interference) problems. For safety reasons it is not allowed to route signal cables through this duct or pipe configurations.

2.3.2.1 Power supply PA 2410/01

	Without transformer	With transformer
Voltage configuration	3-phases, Neutral and ground	3-phases and ground
Frequency	50 - 60 Hz	50 - 60 Hz
Frequency stability	± 2%	± 2%
Maximum power consumption	7 kVA	7 kVA
Nominal mains voltage ± 10% (between phases)	400 Volts	208 230 400 480 Volts
Corresponding full load current	10 Amp.	19 18 10 8 Amp.
Corresponding external fuse	16 Amp.	20 20 16 16 Amp.
External fuse type	Slow-blow "D-type"	Slow-blow "D-type"
Inrush current	≤ 150 Amp. (5 msec)	≤ 150 Amp. (5 msec)
Power factor	≥ 0.85	≥ 0.85
Line voltage fluctuation	<p>According to EN 60204 and IEC 60204:</p> <p>Voltage Steady state voltage: 0.9 ... 1.1 of nominal voltage.</p> <p>Frequency 0.99 ... 1.01 of nominal frequency continuously; 0.98 ... 1.02 short time.</p> <p>Harmonics Harmonic distortion not to exceed 10 % of the total r.m.s. voltage between live conductors for the sum of the second through to the fifth harmonic. An additional 2 % of the total r.m.s. voltage between live conductors for the sum of the sixth through to the 30th harmonic is permissible.</p> <p>Voltage unbalance Neither the voltage of the negative sequence component nor the voltage of the zero sequence component in three-phase supplies shall exceed 2 % of the positive sequence component.</p> <p>Voltage interruption Supply interrupted or at zero voltage for not more than 3 ms at any random time in the supply cycle. There shall be more than 1 s between successive interruptions.</p> <p>Voltage dips Voltage dips shall not exceed 20 % of the peak voltage of the supply for more than one cycle. There shall be more than 1 s between successive dips.</p>	
Mains cable	<p>Connection to facility power supply system shall be made by a 4 or 5 -core cable type and cross-section according to appropriate international standard or local regulatory requirement. E.g. AWG 12.</p>	

Figure 17 Power supply PA 2410/01

2.3.2.2 Power supply PA 2410/00

AX-201	
Voltage configuration	3-phases and ground
Frequency	50 - 60 Hz
Frequency stability	± 2%
Maximum power consumption	7 kVA
Nominal mains voltage ± 10% (between phases)	208 230 400 480 Volts
Corresponding full load current	19 18 10 8 Amp.
Corresponding external fuse	20 20 16 16 Amp.
External fuse type	Slow-blow "D-type"
Inrush current	≤ 150 Amp. (5 msec)
Power factor	≥ 0.85
Line voltage fluctuation	<p>According to EN 60204 and IEC 60204:</p> <p>Voltage Steady state voltage: 0.9 ... 1.1 of nominal voltage.</p> <p>Frequency 0.99 ... 1.01 of nominal frequency continuously; 0.98 ... 1.02 short time.</p> <p>Harmonics Harmonic distortion not to exceed 10 % of the total r.m.s. voltage between live conductors for the sum of the second through to the fifth harmonic. An additional 2 % of the total r.m.s. voltage between live conductors for the sum of the sixth through to the 30th harmonic is permissible.</p> <p>Voltage unbalance Neither the voltage of the negative sequence component nor the voltage of the zero sequence component in three-phase supplies shall exceed 2 % of the positive sequence component.</p> <p>Voltage interruption Supply interrupted or at zero voltage for not more than 3 ms at any random time in the supply cycle. There shall be more than 1 s between successive interruptions.</p> <p>Voltage dips Voltage dips shall not exceed 20 % of the peak voltage of the supply for more than one cycle. There shall be more than 1 s between successive dips.</p>
Mains cable	Connection to facility power supply system shall be made by a 4-core cable type and cross-section according to appropriate international standard or local regulatory requirement. E.g. AWG 12.

Figure 18 Power supply PA 2410/00

■ Grounding

Connection	The machine must be connected to factory grounding via the mains cable
Earth resistance	< 0.1 Ohm

2.3.3 Compressed air and vacuum supply

An air supply with a pressure of 6 to 8 bar must be connected to the system. On the top left side of the electric controller a 1/4" connection is located.

Vacuum will be generated via the use of a venturi.

However, it is possible to connect the system to the factory vacuum system via a quick release coupling, suitable for vacuum.

Description	Specification
Pressure at system	6-8 bar (6-8 x 10 ⁵ Pa)
Flow (use vacuum generating)	190 NI/minute
Flow (use factory vacuum)	35 NI/minute
Oil content	≤ 0.1 mg/m ³
Size of dust particles	< 10 µm
Dew point	< 2°C at 7 x 10 ⁵ Pa < 4°C at 7.2 x 10 ⁵ Pa
Connection to system	Via bulk-head coupling, LCK- 1/4 - PK9 (see Figure 16)

Figure 19 Compressed air supply, specification

Description	Specification
Pressure at system	- 0.85 ± 0.1 Bar
Flow	25 NI/minute
Connection to system	Via bulk-head coupling, KS - PK6 - 1/8 (see Figure 16)

Figure 20 Vacuum supply specification



NOTE: The pressure specified must remain within specification at maximum flow.



NOTE: A compressed air supply that does not meet the specifications will increase maintenance actions.

2.3.4 SMEMA electrical interfacing

Location of the connection points, see [2.3.1 Location of connection points](#).

To let the machine work with adjacent equipment in a flow line, it complies with the SMEMA standards.

To sequence boards properly from machine to machine two signal lines are used: "Busy" and "Board available".

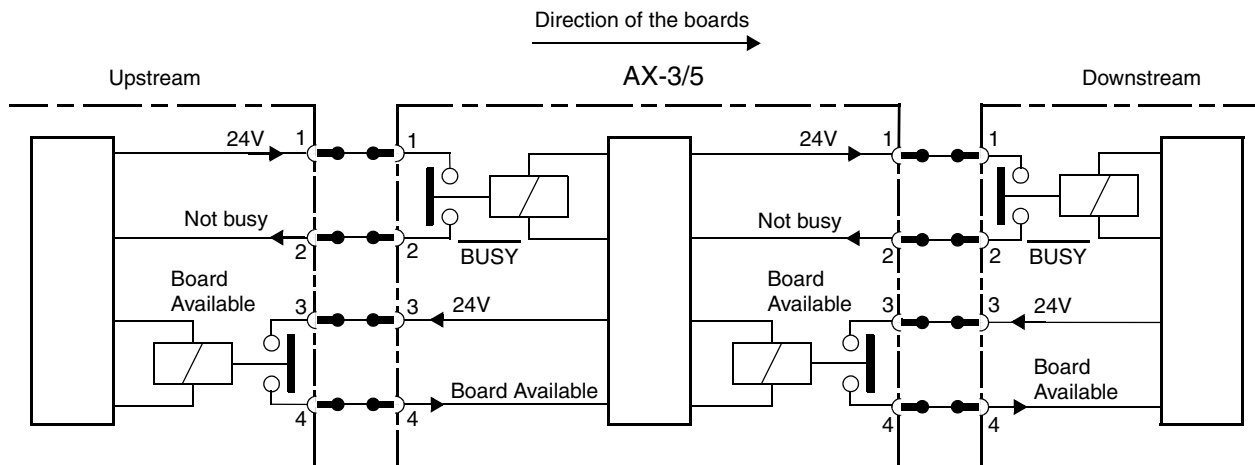
2.3.4.1 SMEMA, electrical interface cable

One SMEMA interface cable (length 2000 mm) is supplied with the machine.

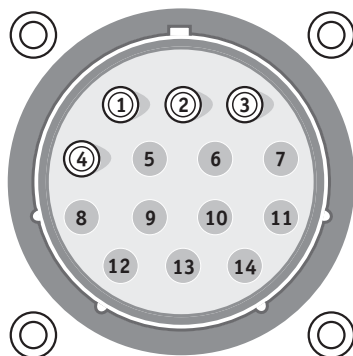
Cable specifications:

- 4 wires.
- Cable connector for both ends consisting of the following parts per connector:
 - CPC 14p connector pin: AMP 206044-1
 - 5-pin contacts: AMP 202236-1
 - cable clamp: AMP 206070-1

2.3.4.2 SMEMA, electrical interface, connection diagram



2.3.4.3 SMEMA, electrical interface, features



PIN	Connector upstream machine	Connector downstream machine
1	24V from upstream machine	24V to downstream machine
1-2	AX is: NOT BUSY..... 1 - 2 Closed BUSY 1 - 2 Open	Downstream machine is: NOT BUSY: 1 - 2 Closed BUSY 1 - 2 Open
3	24V to upstream machine	24V from downstream machine
3-4	Upstream machine has: BOARD AVAILABLE ... 3 - 4 Closed	AX has: BOARD AVAILABLE 3 - 4 Closed

2.4 Optional site preparation

2.4.1 Off-line production preparation area

To prepare feeders, toolbits or other tooling products a separate area in the neighbourhood of the machine is recommended.

2.4.2 Maintenance area

A separate room for maintenance actions is strongly recommended.

The most important activities in the maintenance area are off-line maintenance and repair actions.

■ Layout maintenance area

The maintenance area must be equipped with the following features:

- Mains supply.
- 230V power supply.
- (Special) tools.
- Exhaust system.

If cleaning solvents are used which may give off harmful vapours, the area must meet the local safety requirements and a proper means of disposal of waste materials is recommended.

The maintenance area must be ESD (electrostatic discharge) safe.

2.4.3 Storage and logistics

■ Storage

Other aspects which should be considered are:

- Storage cabinet for CD's, diskettes, documentation, updates, Service informations (SI), Logbooks, etc. Keep this machine related material in a dust proof area nearby the machine.
- Storage cabinet for chemicals. (For material safety data sheets (MSDS), see service manual)
- Storage of spare parts, consumables, etc.
- Storage facility for feeders etc.

■ Logistics

Logistics system to control:

- defective items not to be reused on the machine
- the usage of tools, feeders, etc.
- the flow of items shipped to Assembléon for repair/refurbishment.

2.4.4 External emergency circuit connection

An external emergency circuit can be connected to the machine. Both 'master' and 'slave' function.

Contact load	min. 50 mA (potential-free break contacts) max. 2 A
Contact type	mechanically forced interrupt

2.4.5 Network connection

If the machine needs to communicate with a Production Preparation System (PPS) or another computer system (e.g. a remote host system), a thin wire LAN Ethernet connection must be available in the neighbourhood of the system.

The system software uses the software protocol TCP/IP.

The signal cables, such as SMEMA, LAN and telephone, must be separated from the power supply.

2.5 Operation tools

- These chapters provide an overview of all tools recommended for **everyday use**.
 - [2.5.1 Setup tooling kit \(PA 2435/00\)](#)
 - [2.5.2 Maintenance kit \(PA 2440/00\)](#)
 - [2.5.4 Standard materials](#)
 - [2.5.5 Recommended standard tools](#)

- These chapters provide an overview of all tools recommended for **preventive and corrective maintenance**:
 - [2.5.6 Recommended Assembléon tools](#)
 - [2.5.7 Recommended special tools](#)

2.5.1 Setup tooling kit (PA 2435/00)

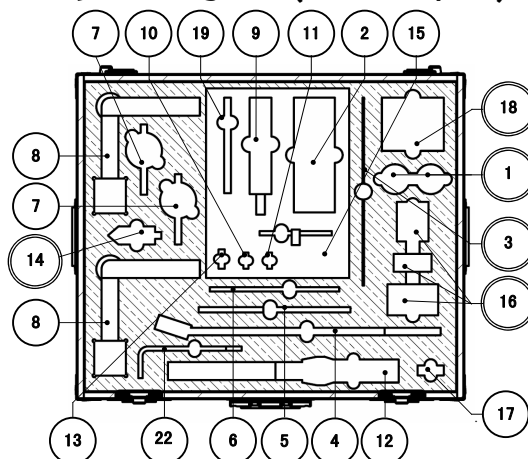

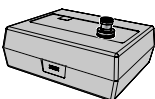
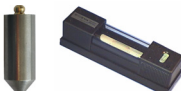
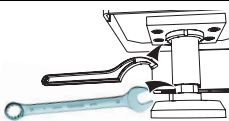
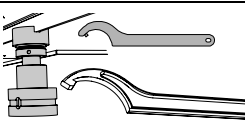

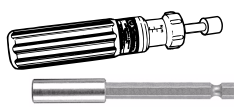


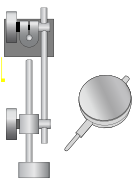
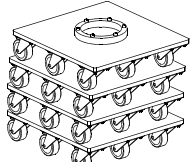


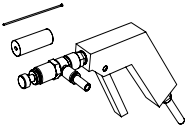
Figure 21 Setup tooling kit , contents

Item	Description	Qty	Ordering code	Application	Identification and picture
1	Calibration nozzle	2	5322-360-10311	Calibration, placement head HA	
18	Nozzle set 5 x L8	1	9498-396-01874	Calibration, placement head DV	
2	Spirit level	1	9498-396-00097	Levelling	
14	Plumb line	1	-	Positioning	
4	Open ended spanner 36 mm	1	9498-396-00037	Levelling, mounting on crate bottom	
5	Hook spanner 68-75	1	9498-396-00035		
16	Levelling jig	1	9498-396-02082	Machine levelling (Hook spanner 68-75 is item 5)	
6	Hook spanner 45-50	1	9498-396-02078		
12	Torque wrench 10-100 Nm	1	9498-396-02079		
17	Bit holder insert tool	1	9498-396-02080		
13	Hex bit 8 mm	1	9498-396-02081		
9	Torque screw driver 0-6 Nm	1	9498-396-02084		
19	Extended bit holder 150 mm	1	9498-396-02085		
11	Ball hex 4	1	-		
10	Ball hex 3	1	-		
22	Panel removal key	1	9498-396-02083		
3	Transport calibration plate	1	5322-466-11588	Calibration	
7	Clock gauge	2	9498-396-00181	Levelling, range 10 mm, accuracy 0.01 mm. Support	
8	Measuring support	2	9498-396-00182		

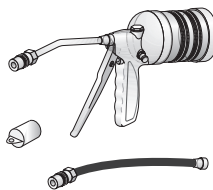
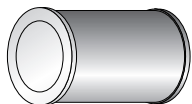




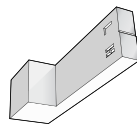





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2.5.1.1 Setup tooling, optional tools

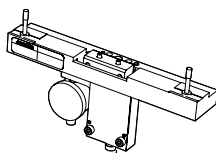

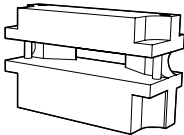


Description	Ordering code	Application	Identification and picture
Installation wheel set	9498 396 00145	Set of 4 lorries for manual machine transportation.	4022 510 1763 

Description	Ordering code	Application	Identification and picture
Placement head cleaning tool	9498-396-00558		

2.5.2 Maintenance kit (PA 2440/00)

Description	Ordering code	Amount	Used for	
Lubricating kit				
Grease gun	5322-395-10615	1	-	
Flexible hose	9498-396-02040	1	-	
Protection cap	-	1	-	
(Kluber) Isoflex Topas NCA52	5322-390-10151	1	Grease for XY robot bearings	
Lithium based grease NSK 1	5322-390-20159	1	Transport spindles, guides	
Anti score EP lube 3 grease	9498-396-00143	1	Placement head HA Z-motor, guide	
Optical kit				
Camel hair brush, optical tissues	9498-396-00043	1		
Miscellaneous				
Dust catch filter tool	5322-395-10774	1	Replacement tool for filters in placement head HA nozzles	
Board dismantling tool	5322-395-10282	1	Remove controller boards from control supply unit	
Filter element 0.3	9498-396-00062	2	Pneumatic air supply	
Filter (fan)	9498-396-01724	6	Air filter controllers	
Calibre Z-lift	9498-396-01905	1	Z-lift placement heads DV, adjustment	
Tie-wraps 15 cm	-	100	Fixation cables heads	
Tie-wraps 10 cm	-	100	Fixation cables heads	
Flatcable bracket (Large)	-	5	Placement head DV and Z-lift	
Loctite 243	-	1	All screws above Z=0 level unless otherwise defined	
Fuse puller	9498-396-02119	1	Pull fuses from boards	
PU HOSE 4	-	1 mtr	Manifold from AQ to AX-201	

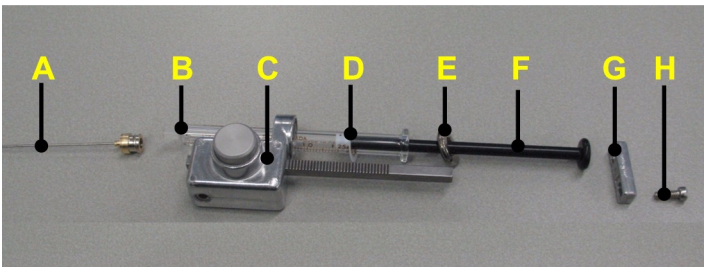


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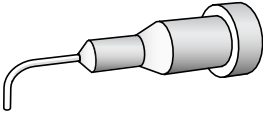
Description	Ordering code	Amount	Used for	
Encoder tool	9498-396-02059	1	Adjustment of encoders on Y-axes	
Plastic distance plate	9498-396-02075	1	X encoder adjustment	
Linear scale mounting tool on X-axis	9498-396-02024	1	-	
Linear scale mounting tool on Y-axes	9498-396-02026	1	-	
Assortment box				
Dust catch filter	5322-480-10169	1	Nozzle placement head HA	
Carbon brushes	9498-396-01388	16	Motors placement head HA	
Fuse slow F5x20 2 A	9498-396-00492	20	All boards	
Fuse slow F5x20 4 A	9498-396-00263	20	All boards	
Screw M1.8X4	5322-502-14433	20	Nozzle	
Screw M2.5X 8	9498-396-00250	10	Sensor Z-lift	
Screw M3X5	9498-396-00390	20	Placement head DV on interface bracket	
Screw M3X6	9498-396-00474	20	Encoder on X-axis	
Screw M3X8	9498-396-00475	20	Manifolds	
Screw M3X16	9498-396-00476	20	Encoder on Y-axes, power supply	
Screw M4X6	9498-396-01882	20	Controllers placement head DV Bracket pneumatic controller	
Screw M4X8	9498-396-01883	10	Clamps, pneumatic controller, fans Y-axis	
Screw M4X10	9498-396-01884	20	Bracket pneumatic controller Z-lift placement heads DV	
Screw M4X12	5322-502-14434	20	Interface placement head HA, bottom	
Screw M4X16	9498-396-01885	10	X-sensor	
Screw M4X20	9498-396-00584	20	Interface placement head HA, top	
Screw M4X25	9498-396-01886	10	BA camera	
Hex lock nut M4	9499-396-00665	10	Fans Y-axis	
Washer 3.2X7	9498-396-00699	20	All M3 screws placement head DV, manifold	
Curved spring washer M3	9498-396-00769	20	All M3 screws	
Curved spring washer M4	9498-396-00903	20	All M4 screws used in X-carriage	

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Description	Ordering code	Amount	Used for	
Washer PF 3.2X7	9498-396-00951	20	Protection boards, manifold, DV controllers	
Washer 4.3X9	9498-396-00904	20	All M4 screws placement head DV on bracket	
Washer PF-CP M2,5	9498-396-01068	20	Manifold placement head HA	
Earth washer STL ST 4.3X8	9498-396-01069	10	Fans, brackets	
Earth washer STL ST 5.3X10	9498-396-01082	10	Hood, side plate	
Earth washer STL ST 6.4X14	9498-396-01188	10	Earth to covers	
O-ring placement head HA	5322-530-10386	10	Nozzle interface	
O-ring 2.3 x 0.9	5322-530-51243	10	Behind pressure sensor on manifold HA Pneumatic controller interface	
Sealing plate	5322-466-12073	10	For nozzles placement head HA	
Fixing eye of tie-wrap	9498-396-01394	10	Cables in control supply unit	
Hose pillar RTU-PK-3/3	9498-396-01881	6	Manifold from AQ to AX-201	
Contact pen	9498-396-00125	5	Trolley to lift electrical interface	
PCB spacer RLCBSRE-10	9498-396-01887	10	Placement head HA, transport controller in control supply	
Cable clamp	9498-396-01888	10	Base	
Cable clamp 4.8	9498-396-01889	10	Encoder cable, BA camera	
Flatcable bracket (Small)	-	5	Control supply unit	
End stop Z-lift DOWN	9498-396-01892	4	Z-lift placement head DV	
End stop Z-lift UP	9498-396-01893	8	Z-lift Placement head DV	

2.5.3 Lubricating tool for placement head DV and Z-lift

Placement head lubrication tool 9498-396-01954			
A	Needle (set of 6)	9498 396 01998	
B	Container	9498 396 02000	
F	Plunger		
C	Dispenser	9498 396 01999	
D	Nylon ring		
E	Flange screw		
G	Plunger arm		
H	Screw		
Grease (IKO)		9498 396 02001	
Needle guidance		9498 396 01996	

Bended needle		9498-396-02438	
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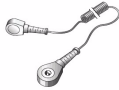
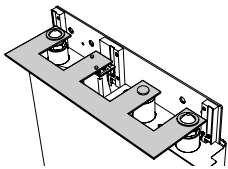
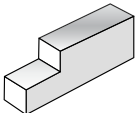

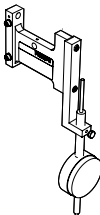
2.5.4 Standard materials

Description	
Fibre free tissue	Local purchase
Keyboard cleaner	Local purchase
Ethanol	Local purchase
Clean air spray	Local purchase
Vacuum cleaner with plastic attachments	Local purchase
Anti-static spray	Local purchase
Molykote metal protector	Local purchase
Loctite 243	Local purchase
Protective gloves	Local purchase
Brush soft	Local purchase
Multimeter	Local purchase

2.5.5 Recommended standard tools



Quantity	Description
1	Open end/ring wrench 5 mm
1	Open end/ring wrench 5.5 mm
1 set	Open end/ring wrenches 6 - 24 mm
1	Socket screwdriver 4 mm
1	Socket screwdriver 5 mm
1	Socket screwdriver 7 mm
1	Socket screwdriver 8 mm
1	Socket screwdriver round-head 2.5 mm
1	Socket screwdriver round-head 3 mm
1	Socket screwdriver round-head 4 mm
1	Socket screwdriver round-head 5 mm
1	Allen key 0.9 mm
1	Allen key 1.27 mm
1 set	Allen key 1.5 - 10 mm
1 set	Allen wrenches (short)
1 set	TORX screwdrivers T7 - T40
1	Screwdriver TORX T6
1	Screwdriver TORX T7
1	Screwdriver TORX T10
1	Screwdriver TORX T15
1	Screwdriver no. 1 insulated
1	Screwdriver no. 2 insulated
1	Screwdriver no. 3 insulated
1	Screwdriver no. 4 insulated
1	Screwdriver no. 5 insulated
1	Screwdriver no. 4 short
1	Screwdriver no. 4 square
1	Screwdriver clamping M2 - M3.5
1	Screwdriver clamping M3.5 - M5
1 set	Precision screwdrivers
1	Phillips screwdriver no. 0
1	Phillips screwdriver no. 1
1	Phillips screwdriver no. 2
1	Measuring tape 2 meter
1	Calliper gauge 150 mm
1 set	Feeler gauges 0.03 - 0.5 mm
1	ESD-set
1	Multi meter

2.5.6 Recommended Assembléon tools

Description	Ordering Code	Application	
Wrist band ESD	2622-890-98277		
Spiral coard	2622-890-98352		
Adjustment plate	9498-396-00118	Trolley lift	
Plastic feeler gauge	5322-395-10673		
Trolley extension cable	5322-218-11886		
Encoder tester	5322-395-10773		
Y-calibration tool, A-series trolley	9498-396-00857		
Z-calibration tool, A-series trolley	9498-396-00856		
Suspension beam	5322-535-10577		
Suspension bracket	5322-395-10843		
Carrier detection adjustment tool	5322-395-10841		
Adjustment carrier	5322-466-11767		
Adjustment ring 20 mm	5322-532-12917		
Adjustment ring 26 mm	5322-532-12918		
Assy strip	9498-396-00980		
Extension cable 2, A-series trolley	9498-396-00859		
Extension cable 1, A-series trolley	9498-396-00858		
Gauge board Transport	5322-395-10639	Board transport	
Height block	5322-466-11589	Board transport	
Special wrench	5322-395-10638		
Dial gauge holder Z=0	9498-396-00157	Gauge included	
Lift plate feeder bank	4022-532-06401		
X-Y calibration kit	5322-466-11608	Required for XY robot calibration	
Torque meter (5 N)	5322-395-10692	Required for Placement Head	
Torque meter (20N)	5322-395-80388	Required for Placement Head	
Belt tension indicator	5322-395-10704	Required for Service Kit Feeding	

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2.5.7 Recommended special tools

Description	Application	Picture
Power supply (24 Volt, 5A)	Used when the trolley will not come down from the base	
Belt tension gauge (Range 50-250 Hz, accuracy 2Hz).	Corrective maintenance: belt tension check after Z-motor, Z-belt, X-motor and X-belt replacement.	
Mirror	Adjusting board sensors	